# 4.0 AFFECTED ENVIRONMENT

The following sections provide a discussion of the existing environment that would be affected by the proposed action and alternatives.

## 4.1 GENERAL HANFORD SITE ENVIRONMENT

The Hanford Site, about 1,517 square kilometers (586 square miles) is located in southeastern Washington State, in a semiarid region with rolling topography. Two topographical features dominate the landscape: Rattlesnake Mountain located on the southwest boundary and Gable Mountain located on the northern portion. The Columbia River flows through the northern part and forms part of the eastern boundary of the Hanford Site. Areas adjacent to the Hanford Site primarily are agricultural lands. The 200 East Area and 200 West Area have been used heavily as waste processing and waste management areas.

Designations for land use on the Hanford Site for the next 50 years have been established in the *Final Comprehensive Land-use Plan Environmental Impact Statement* (DOE/EIS-0222-F). These designations on the Hanford Site include preservation, conservation, industrial, and research and development. On June 9, 2000, the Hanford Reach National Monument was established (65 FR 37253) covering approximately 78,900 hectares (195,000 acres) under the preservation land use category. The Hanford Reach National Monument incorporates a portion of the Columbia River corridor, the Fitzner-Eberhardt Arid Lands Ecology Reserve to the south and west, portions of the Hanford Site north of the Columbia River, and recognizes the unique character and biological diversity of the area, as well as its geological, paleontological, historic, and archaeological importance.

The Hanford Site has a mild climate with 15 to 18 centimeters (6 to 7 inches) of annual precipitation, with most of the precipitation taking place during the winter months. Temperature ranges of daily maximum temperatures vary from normal maxima of 2°C (36°F) in early January to 35°C (95°F) in late July. Monthly average wind speeds are lowest during the winter months, averaging 10 to 11 kilometers (6 to 7 miles) per hour, and highest during the summer, averaging 14 to 16 kilometers (8 to 10 miles) per hour (PNNL-6415). Tornadoes are rare in the region surrounding the Hanford Site.

During 2000, the Hanford Site air emissions remained below all established limits set for regulated air pollutants (PNNL-13487). Atmospheric dispersion conditions of the area vary between summer and winter months. The summer months generally have good air mixing characteristics. If the prevailing winds from the northwest are light, less favorable dispersion conditions might occur. Occasional periods of poor dispersion conditions occur during the winter months.

On June 27, 2000, a fire known as the 24 Command Fire, spread rapidly and eventually consumed 66,322 hectares (163,884 acres) of federal, state, and private lands. A total of 24,384 hectares (60,254 acres) within the Hanford Site burned, including lands within the Hanford Reach National Monument, most of the Fitzner-Eberhardt Arid Lands Ecology Reserve, and areas near former production sites. Fire suppression impacts included construction of 66 kilometers (41 miles) of bulldozed fire lines, widened dirt roads, and cut fences (DOI 2000). Impacts to the land should not be permanent because of rehabilitation measures, including revegetation and fence repair.

The vegetation on the Hanford Site is a shrub-steppe community of sagebrush and rabbitbrush with an understory consisting primarily of cheatgrass and Sandberg's bluegrass. The typical insects, small birds, mammals, and reptiles common to the Hanford Site can be found on the 200 Areas Plateau (PNNL-6415).

Relatively undisturbed areas of the mature shrub-steppe vegetation are high quality habitat for many plants and animals and have been designated as "priority habitat" by Washington State.

Most mammal species known to inhabit the Hanford Site are small, nocturnal creatures, primarily pocket mice and jackrabbits. Large mammals found on the Hanford Site are deer and elk, although the elk exist almost entirely on the Fitzner-Eberhardt Arid Lands Ecology Reserve. Coyotes and raptors are the primary predators. Several species of small birds nest in the steppe vegetation. Semiannual peaks in avian variety and abundance occur during migration seasons. Additional information concerning the Hanford Site can be found in PNNL-6415.

DOE-RL and its contractors dominate the local employment picture with almost one-quarter of the total nonagricultural jobs in Benton and Franklin counties. Ninety-three percent of Hanford Site personnel reside in the Benton and Franklin county areas. Therefore, work activities on the Hanford Site play an important role in the socioeconomics of the Tri-Cities (Richland, Pasco, and Kennewick) and other parts of Benton and Franklin counties (PNNL-6415). Other counties are less affected by changes in Hanford Site employment.

## 4.2 SPECIFIC SITE ENVIRONMENT

The proposed TRU waste drum retrieval would occur in a previously disturbed area within the 218-W-4B and 218-W-4C (Figure 2) LLBG in the 200 West Area on the Hanford Site. The 200 West Area LLBG contain generally shallow trenches of about 6 meters (20 feet) deep, around 30 meters (100 feet) wide, and up to 220 meters (720 feet) in length. The two LLBG provide for disposal of LLW and the retrievable storage of TRU waste.

The CWC, also in the 200 West Area, stores mixed LLW, TRU waste, and a small amount of LLW awaiting treatment and final disposal. The storage areas include 12 small mixed waste storage buildings, seven large storage buildings, and the 2420-W Building (used for cask storage). There is adequate storage space available in CWC to accommodate the proposed action. The waste is generally packaged in 208-liter (55-gallon) drums unless alternate packages are dictated by size, shape, or other form of waste. Each drum is handled individually using a hand truck, fork lift, or crane. Drums are placed on wooden pallets with a maximum of four drums handled together; the pallets can be stacked three-high, or 12 drums per stack. The storage buildings or pads have physical features that provide for segregated storage areas to maintain appropriate separation between groups of incompatible waste.

Both the LLBG and CWC are approximately 9.2 kilometers (5.7 miles) southwest of the Columbia River. The 200 West Area is not located in a 100-year or 500-year floodplain, nor located within a wetlands area (PNNL-6415). The elevations for the 200 Areas average about 218 meters (715 feet) above mean sea level. The 200 West Area does not contain any prime farmland, state or national parks, forests, conservation areas, or other areas of recreational, scenic, or aesthetic concern. The proposed action is consistent with the land use designation of industrial exclusive use for such activities as described in DOE/EIS-0222-F. The city of Richland (population approximately 38,000), located about 40 kilometers (25 miles) from the 200 Areas in Benton County, adjoins the southernmost portion of the Hanford Site boundary and is the nearest population center.

### 4.2.1 Soil and Subsurface

The soil in the 200 Areas is predominately a sand and gravel mixture. All areas within the proposed action have been disturbed previously and scraped clean of any vegetation. The geologic strata under the

surface layer, in descending order, are Holocene eolian deposits, Hanford formation, Ringold Formation, and the Columbia River Basalt Group. The eolian sands are fine- to coarse-grained, and relatively quartz- and feldspar-rich. Deposits of the Hanford formation underlie the eolian deposits. Hanford formation strata generally are dominated by deposits typical of the gravel-dominated facies consisting of uncemented granule to cobble gravels and minor coarse-grained sand. This is underlain by the top of the Ringold Formation. Basalt flows of the Columbia River Basalt Group and intercalated sediments of the Ellensburg Formation underlie the Ringold Formation. The region is categorized as one of low to moderate seismicity (PNNL-6415).

### 4.2.2 Hydrology

The water table in the 200 Areas is approximately 75 meters (240 feet) to 90 meters (290 feet) below the surface (PNNL-6415).

### 4.2.3 Air Resources

Air emissions from the proposed action would come from diffuse and fugitive sources, such as soil disruption during excavation as well as releases from vented containers. The activity would require submittal of a Notice of Construction (NOC) per WAC 246-247-110(9), *Radiation Air Emissions*, to WDOH and be subject to approval conditions and limitations. The activity would use all appropriate emission control measures to minimize impact to ambient air. Excavation might involve the use of the specially designed and regulated soil guzzler vacuum excavation system. All drum venting would be through a HEPA filtered venting device.

### 4.2.4 Biological Resources

A Hanford Biological Review ECR #2001-200-064 (Appendix A) was conducted for the proposed action. The 218-W-4B and 218-W-4C LLBG are highly disturbed. No plant or animal species protected under the *Endangered Species Act* (ESA) *of 1973*, on the federal list of "Endangered and Threatened Wildlife and Plants" (50 CFR 17), or on the Washington State list of threatened or endangered species has been found in the area of the proposed action.

### 4.2.5 Cultural Resources

A Hanford Cultural Resources Review #2001-200-064 (Appendix B) was conducted for the proposed action. The review concluded that, "It is the finding of HCRL that no historic properties are affected by this undertaking". Personnel must be directed to watch for cultural materials (e.g., bones, artifacts) during all work activities. If any are encountered, work in the vicinity of the discovery must stop until an appropriately qualified archaeologist has been notified.

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